General anaesthesia under the age of 4 years has minimal impact on future academic performance

Friend, Amanda Jane; Engelhardt, Thomas; Hansen, Tom Giedsing

Published in:
Archives of Disease in Childhood. Education and Practice Edition

DOI:
10.1136/archdischild-2016-312518

Publication date:
2017

Document version
Peer reviewed version

Citation for pulished version (APA):
Friend, A. J., Engelhardt, T., & Hansen, T. (2017). General anaesthesia under the age of 4 years has minimal impact on future academic performance. Archives of Disease in Childhood. Education and Practice Edition, 102(5), [276]. DOI: 10.1136/archdischild-2016-312518

Cohort Study PICKET

Declarative Title: General anaesthesia under the age of 4 years has minimal impact on future academic performance.

STUDY DESIGN

Design: Cohort study

STUDY QUESTION

Patients: All children born in Sweden between 1973 and 1993 who had a single anaesthetic exposure before age 4 years (33514 children).

Comparison: 159 619 matched children who had not been exposed to anaesthesia.

Outcomes: Average (mean) grades in school at age 16 years and IQ test scores at age 18 years obtained at the time of military conscription.

MAIN RESULTS

Outcomes	Mean (95% CI)
Mean reduction in school grades at age 16 cf unexposed children	0.41% (0.7% to 0.12%)
Mean reduction in IQ scores at age 18 cf unexposed children	0.97% (0.15% to 1.78%)
	OR (95% CI)
Likelihood of having grades below 10th percentile at age 16 cf unexposed children	1.02 (0.98 to 1.07)
Likelihood of having no recorded school grades at age 16 cf unexposed children	1.29 (1.17 to 1.42)

CONCLUSION

Although general anaesthesia under the age of 4 was associated with a statistically significant reduction in school grades at age 16 and IQ scores at age 18, the actual differences were minimal (around 1% for IQ scores and 0.5% for school grades). This small risk to future academic performance must be balanced against risks and benefits of postponing surgery in young children.

ABSTRACTED FROM

Glatz, P., Sandin, R.H., Pedersen, N.L., Bonamy, A.K., Eriksson, L.I., Granath, F. 2016 Association of Anesthesia and Surgery During Childhood With Long-term Academic Performance

Amanda J Friend, Division of Women's and Children's Health, University of Leeds School of Medicine, Leeds, UK
Amanda.friend@nhs.net

As far as epidemiological studies of children undergoing anaesthesia go – this is probably as good as you can get them. This large-scale, nation-wide Swedish study addresses a fundamental question in paediatric anaesthesia: Is general anaesthesia harmful to the developing brain? Statistically seen possibly 'yes' but clearly other factors matter much more to the child. These factors include sex, age of string school and maternal background. The finer details of this complex interaction of surgery, co-morbidities, social background and perioperative care are more relevant to the individual. It appears that the conduct of anaesthesia rather than the drugs is responsible for neurocognitive impairment and is starting to receive the attention it deserves. (1) This study in conjunction with 2 recently published prospective clinical trials is likely to result in a decrease in pre-clinical anaesthesia research activity. (2,3) On the other hand, prospective quality improvement programmes will further improve the of safety perioperative care in children. Research funding should and will be redirected from finding the cure for a non-existing 'disease of anaesthesia' to cement the fundamental role of education, teaching and research in paediatric anaesthesia. Children deserve to be treated in a competent and child-friendly environment by knowledgeable and appropriately trained paediatric staff. They should not be pawns to serve individual or institutional ambitions.
One additional notable result of this study is establishment of 'academic performance' (an apical outcome measure) as a valid and pragmatic outcome measure for epidemiological studies in children. This is what matters most to the parents and society. Such studies will enable the global comparison of 'big data' projects and measure the effects of intervention.

1. Weiss M et al Safe Anesthesia For Every Tot - The SAFETOTS initiative. *Curr Opin Anaesthesiol. 2015;28:302-7.*

2. Davidson AJ et al. Neurodevelopmental outcome at 2 years of age after general anaesthesia and awake-regional anaesthesia in infancy (GAS): an international multicentre, randomised controlled trial. *Lancet. 2016; 387(10015):239-50.*

3. Sun LS et al. Association Between a Single General Anesthesia Exposure Before Age 36 Months and Neurocognitive Outcomes in Later Childhood. *JAMA. 2016;315(21):2312-20.*

Englehardt, T., Hansen, T.G.